

# NEW DISCOVERIES ALL OVER THE EARTH

## Does Killing the GERMS in MILK Make Us EAT MORE DIRT?

MILK is the most widely used of all foods, and it is also the one regarded with the most suspicion by science. Unless the greatest care is used milk becomes the medium through which all sorts of deadly disease germs find their way into the human system.

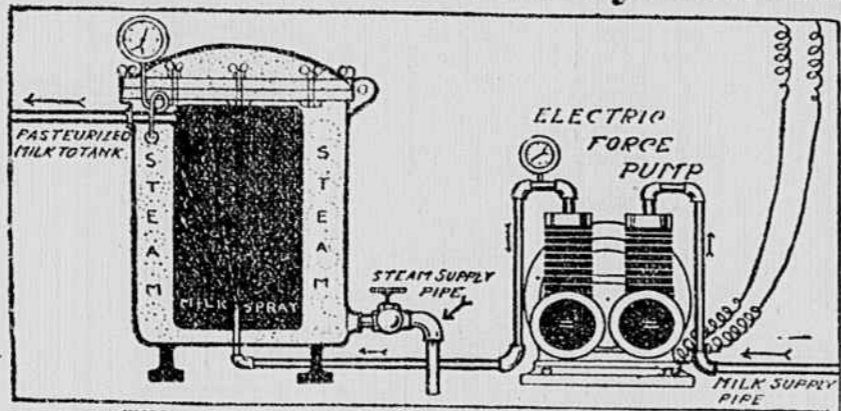
These disease germs can be killed by subjecting the milk to the process known as pasteurization, but many food experts object to this and other sterilizing measures on the ground that they vitalize the milk, spoil its flavor and decrease its nutritive value. Another argument now being made against pasteurization is that this process tends to encourage careless, filthy habits on the part of dairymen and dealers, and makes it difficult for the consumer to tell whether his milk is full of dirt.

Dr. Eric Pritchard, an eminent English physician, is one of the scientists who do not share these views. In explaining why he thinks it wise for all milk to be pasteurized, he says:

"After reviewing the arguments for and against the sterilization or pasteurization of milk, I came to the general conclusion that, except in one comparatively unimportant and easily remedied particular, these procedures in no way impaired the digestibility or the nutritive properties of the raw product. On the other hand, I adduced evidence to show that the risk of infection with diseases of both human and bovine origin is real and serious if milk is consumed in the raw state. As further emphasizing the danger of milk infection, I would now add that during the years 1907-11 there were five serious milk epidemics in the city of Boston, involving risks to the lives of 4,095 persons. These epidemics took the forms of diphtheria, scarlet fever, enteric fever and sore throat.

An examination of the epidemic records of many English towns proves that in this country equally serious indictments can be urged against the use of raw milk. No precautions short of killing all disease germs,

## Pasteurization Destroys the Disease Microbes but Makes It Less Easy to Detect Filthy Methods on the Part of Dairymen and Dealers



THE NEWEST PASTEURISING APPARATUS. The milk is sprayed into a chamber where steam brings it to a temperature of 135 degrees. As soon as it reaches that point it is forced into a refrigerating tank and quickly cooled. The machine can be easily cleaned by forcing hot water through it before the milk is introduced.

should such be present, by heat or other means, can make raw milk perfectly safe. Further, no man can guarantee that any particular sample of milk has not been thus exposed; indeed, quite a serious outbreak of scarlet fever occurred some little time ago in America among persons who consumed certified milk of the highest quality, obtained from a seemingly unimpeachable source. On the other hand, as far as I am aware, no case of infective disease, much less an epidemic, has ever been traced to the use of pasteurized milk.

"If the heating or pasteurization of milk can thus ensure immunity from the dangers due to its accidental contamination with the germs of disease, it may well be asked why should not all milk be so treated before consumption. One of the arguments is that this procedure can effectively cloak dirty production and careless distribution. Dirty milk is always teeming with bacteria, and within limits the number is proportional to the age of the milk, the temperature at which it has been kept and the amount of dirt present. The more numerous the bacteria the sooner does milk become sour; but when milk has been pasteurized it does not readily turn, and the public thereby may be deprived of a useful and practical criterion of the extent of the contamination.

"The same argument, however, could be advanced against the practice of refrigerating milk immediately after it has been drawn from the cow. This danger, namely, that the pasteurization of milk may cloak contained dirt, is more theoretical than real, for stale and dirty milk, in spite of pasteurization, would betray itself to the palate, and would easily reveal itself in a laboratory examination by the number of moulds and liquefiers, and by other evidences of contamination present in the sample.

"Without being aware of the fact, Londoners consume

a considerable quantity of milk which has been pasteurized, perhaps more than once, and, although possibly there is no valid objection to this treatment as far as the food value of the milk is concerned, in all justice, the consumer ought to be informed of the fact, for raw milk unadorned is a higher grade product than pasteurized milk, which still appears to be fresh.

"It must be remembered, however, that efficient pasteurization greatly increases the cost of production, especially to the small dairyman with a limited business. The best modern plant is very expensive, while increased standing costs for rent, rates, taxes, labor, fuel, power, refrigeration and a greatly increased charge for bottles necessarily make pasteurization a very costly procedure. It is the apprehension of these facts that makes the average dairyman oppose the practice of pasteurization. If the general vogue of milk comes into the dairy business into a few hands, and this would doubtless be to the benefit of the public, for the cleaner production of milk must entail constant supervision and inspection."

Most persons will be ready to believe that the centralization of sterilizing plants under scientific management would minimize the dangers of dirt entering into the product. A new process recently invented by Dr. Lobbeck, of Leipzig, appears to limit the dirt bacteria, while preserving the natural qualities of the milk treated.

The ordinary method of pasteurization consists in heating the milk to a temperature of from 144 to 149 degrees. The new method consists of a more sudden heating to about 135 degrees, followed by an immediate cooling, the theory being that harmful bacteria are instantly destroyed by the right temperature, while a change in the flavor and other qualities of the milk requires longer time to effect.

The apparatus consists of two cylinders, one inside the other. The milk enters the inner cylinder through a blast-pipe in the form of a spray. The space between the two cylinders serves as a heating chamber into which steam enters by lateral tubes and heats the milk to the desired temperature. The two compartments are closed by tightly fitting lids or caps. The accessory parts are a force-pump, a pressure reservoir and a refrigerating apparatus. This last is provided with a hood to prevent infection from outside and contact of the air with the cooling surfaces.

The force-pump draws the milk, and throws it into the reservoir, where it finds a pressure of three or four atmospheres. A regulator prevents this degree of pressure being exceeded and pushes all excess of milk toward the reservoir.

An excellent feature of the machine is the ease with which it is cleaned and sterilized. This is accomplished by the simple method of operating it for ten minutes with very hot water instead of milk. The sterilizer can then be set to work and will run for hours without interruption and without attention.

A convenient way of testing milk to determine its proportion of dirt is to strain a given quantity—say a pint—through a disc of cotton cloth. The amount of dirt remaining on the surface of the cloth disc will enable you to calculate the proportion. The best of the dairy products called "nursery" milk will leave hardly any stain upon the disc through which it is strained, while ordinary milk supplied by New York, Chicago and London dairies will leave a palpable lump of dark colored sediment.

Investigation has shown that the quantity of dirt which finds its way into milk between the time of milking and the time of consumption is considerable. It has been estimated that Chicago annually consumes twenty-five tons of dirt in its milk supply. A few years ago Professor Delepine calculated that 100 pounds of dirt was contained in every 10,000 gallons of milk supplied to the city of Manchester, England.

Of the grading and handling of milk for consumption in large cities, Dr. Pritchard writes:

"The sooner the public learn that milk must be graded the better will it be for all persons concerned. It is quite impossible that the sale of milk can remain much longer exempt from the influence of ordinary commercial laws. In all other business transactions there is a relationship between quality and price; in the milk trade no such relationship is acknowledged. In the grading of milk there is, and probably always will be, a considerable difficulty; the same difficulty presents itself in arranging a sliding scale of charges to correspond with the varying qualities of the milk.

"But if clean, properly pasteurized milk is delivered in efficiently washed and sterilized glass jars there can be no question of the superiority of such a method of delivery over that now customary in this country. As the delivery of milk in this manner is only now coming slowly into vogue it would be a great gain if proper requirements in this connection were to be immediately formulated before their enforcement could be opposed as a hardship.

"Although I think I could state fairly accurately the number of bottles of milk of the quality of 'certified milk' sold in London daily, I refrain from doing so for very shame. Milk of a slightly inferior grade to 'certified milk' is sold in America under the designation of 'inspected milk' at a considerably lower price. Such milk must be derived from non-tuberculous cows, show a count of not more than 100,000 bacteria per cubic centimetre and be produced under approved conditions. Milk of lower grade than this is sold as 'market milk' or 'pasteurized milk.' In its raw state such milk should not contain more than 1,000,000 bacteria per cubic centimetre (New York), 500,000 per cubic centimetre (Boston), 100,000 per cubic centimetre (Rochester)."

## Why LOVE NEVER DRIVES Any Man to SUICIDE

IN a well-reasoned analysis of the causes of suicidal depression, Dr. H. Kahane, of Vienna, advances substantial proof to show that there is no such thing as a man committing suicide because of an unfortunate love affair, and that the cases in which women have done so are extremely rare. Dr. Kahane opposes the modern idea that love is an important element in conditions of health and illness, and remarks that "in man the flame soon dies down, and the comfort of the family table, regular habits and the warm, quiet home are, at a consciously or subconsciously blended in the love passion."

So far as women are concerned, he declares that, consciously or unconsciously, the average woman is aware that she has to depend for her food and shelter, for her living, in fact, on attracting a man to provide for her through love. Consequently he asserts that to a woman love is largely a side issue of the general instinct for self-preservation.

It is for this reason that Dr. Kahane regards suicides as being almost invariably evidences of lack of material success, rather than the result of an over-ardent passion. He declares that the love-impulse in the soul is no greater than it is in the body. It is only momentary in the latter, and has comparatively little effect on one's general health. He believes this holds true of the soul as well, and that mental disturbances of any sort can seldom, if ever, be traced to the love-impulse.

In analyzing a large number of suicides, both

in Europe and America, it is shown that of those in which men were deemed to have been the victims of love melancholy, nearly 80 per cent were in financial difficulties, having either lost a job shortly before or having been unfortunate in some speculation. This leaves but 20 per cent to be considered. All cases of feeble-mindedness were, of course, eliminated. Of this remainder more than half were drug fiends or users of alcohol, leaving but a few doubtful cases which could be classified as love suicides. Careful investigation into the families of each of these showed an essential constitutional weakness, or a high degree of nervous irritability.

A man suicide-for-love, a broken heart and snakes in Ireland, according to Dr. Kahane, all belong to the same group of myths.

Where women are concerned it is impossible to secure conclusions as definite. Dr. Kahane suggests that since winning a man's love is woman's principal business, failing to do so must be classed as a business failure. From an American point of view this would hardly meet general agreement, although it contains a germ of truth.

The Vienna specialist seems to touch a more probable point when he suggests that many of the women suicides for love take their own lives because they have built upon the idea of their lover the whole fabric of their existence. When this love goes, their entire universe seems to fall. That it doesn't fall is evidenced by the fact that a number of the would-be suicides whom Dr. Kahane has argued out of their suicidal intentions married someone else quite gaily within a few months or a couple of years, at most.

None the less many women vastly overemphasize the importance of love in daily life, and herein there is danger. With them an unfortunate love affair often proves the spark which ignites a train formed by other circumstances, in which the victim gives an exaggerated importance.

Results from testing criminals have been startling and peculiar. In a great many cases grown men and women have not gone higher than ten or twelve years in mental age. In the case of children the tests have indicated other things besides their mental age—they have indicated the general vocation for which the child is best adapted.

## Finding How OLD Your BRAIN IS

WHAT is your mental age? It makes no difference what your actual age is, you have what is now known as a mental age—somewhere between six months and twenty-five years or thereabouts.

Among school children it has long been noticed that some, much older than others in point of years, were a good distance behind them mentally. The idea was evolved that if children, imbeciles and criminals could be given simple tests to determine exactly how far advanced they were mentally, a good deal of trouble could be saved—in children by placing them in the proper grade at school, in imbeciles to determine exactly what would be best for their welfare, and in criminals to determine the responsibility in a moral way for their crimes.

Thus if a criminal were found to be only eight years old mentally, then the proper way to treat him, no matter what his actual age happened to be, would be the way a boy eight years old committing the same crime would be treated.

Tests applicable to different normal ages were worked out by patient psychologists and others. By experience with

various classes of subjects these tests have now been boiled down to simple and certain tests of mentality by means of which a person may be ticketed with his proper mental age and treated accordingly.

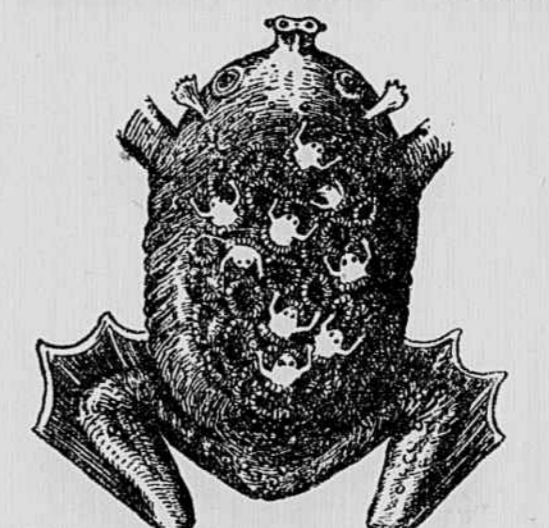
Binet has a good many tests that have been modified by experience into what are known generally as the Binet tests. They run all the way from recognizing a hand waved in front of the eyes for a tiny infant to remembering sequences of numbers and describing the various articles seen in a picture but for a moment, for older ones.

It is the endeavor of some humane societies to have a law passed to test all criminals, and that, if found of small mental age, they shall not be punished in the ordinary way. It has also been suggested that our own civil service use these tests instead of the oftentimes absurd examinations now used.

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There are many kinds of verterbrates which carry their eggs or young. The frog fish, of Surinam, carries its eggs on the under side of its body, holding them on by special blood vessels. Here it is the female that carries the eggs. Certain species of snail carry the eggs in the mouth and around the gills, which is the male who does the carrying. Here it is the male who does the carrying. In the sea urchin and sea horse the male has a brood pouch on the under side of the body.

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A Female Frog-Fish Carrying Her Young in Snug Little Pouches on the Under Side of Her Body.

## How One City Has ABOLISHED FOG

By spreading a thin coat of oil over the surface of the rivers which surround it, the city of Lyons, in France, has abolished fog. It was found that out of every year, an average of sixty-two days were sufficiently foggy to cause trouble to traffic, and the loss to business was consequently large.

The hindrance to trade resulting from foggy weather on one sixth of the business days is estimated at about \$50,000 a year. The cost of spreading oil on the rivers has been found to be \$29 a day, which, for sixty-two days, equals \$1,798 for the year. The saving to the city, therefore, is over \$18,000 per year.

For a considerable time the city of Lyons has been experimenting with the abolition of fogs. Owing to



"In Lyons, as in Pittsburgh, the fog problem is due to the location of the city at the point where two rivers unite. High hills on every side prevent the escape of the condensed moisture."

the location of the town, at the union of two navigable rivers, the Rhone and the Saone, the fogs of Lyons are local. They are due to the evaporation of the rivers and to the high land surrounding Lyons on every side, which prevent the escape

of the condensed moisture. It is not a smoke-infested city, though having many manufacturing industries, but the health of its half a million population suffers greatly from the prevalence of mists.

Great blowing machines were established upon the heights to keep a steady current of air blowing during misty days, but the power required for this was so costly as to render the continuance of the project inadvisable.

It is estimated that a gallon of oil is sufficient to cover 150 acres of water. In spite of the greater cheapness of mineral oil, it is expected that either an animal or vegetable oil will be used, as these possess greater tenacity, and will not break on the surface of the water, no matter how thin the film may be.

## STAMPING OUT TYPHOID Helps Prevent TUBERCULOSIS

THERE was a time hardly a dozen years ago when doctors made numerous mistakes about typhoid fever and tuberculosis. Indeed it was no uncommon error for a doctor to treat as typhoid fever malignant cases of tuberculosis.

Although Koch discovered the bacillus of tuberculosis thirty-four years ago, and Vidal, Grunbaum, Pfeiffer and others discovered but a short time afterward the fact that the blood serum of typhoid sufferers will clot and kill fresh mixtures of typhoid germs, it really remained for additional tests and a new generation of doctors to make a clear distinction between some types of consumption and typhoid.

Professor W. T. Sedgewick, of the Massachusetts Institute of Technology, and Dr. Charles E. Woodruff,

working independently, have just brought to light proof that the methods used to stamp out typhoid fever are at the same time a body blow to the tuberculosis monster.

When Brutus is sick, it is not during the "vile contagion of the night" which has made him so, for night air is safe and pure, despite widespread belief to the contrary. When Brutus drinks unfiltered water—there's the rub. Timon of Athens could have given his guests no sorer punishment than to serve them with the vile, unfiltered water on which too many American cities still have to depend.

Dr. Hazen, another hygienist, says that for every typhoid fever death prevented by filtered or boiled water, two or three lives are saved from tuberculosis and other maladies. Statistics prove that waters in-

fectured with dust and human refuse increase the death rate from tuberculosis and purified drinking water lowers it.

Dr. Woodruff has definitely found that tuberculosis follows typhoid fever far more frequently than doctors have even suspected. He cites the fact that tuberculosis is not inherited, but that babies begin to acquire the disease as soon as they begin to crawl around and pick up its bacilli from the ground and floor.

A startling claim made by Dr. Woodruff is this: He says there is no undisputed evidence that any adult ever acquires tuberculosis. It was all caught in childhood. When grown-ups develop active tuberculosis it is not a new infection. It is only bringing into action germs which they have had from childhood. Drinking impure water is one of the chief ways of bringing about this unhappy result.

One in every eight persons dies of tuberculosis. Seven in every eight have tuberculosis. Persons like the Indians who are used to an outdoor life are less infected at first, but when they do become housed up and are brought into contact with these microbes they have no immunity with which to fight them, so they die like flies.

Tuberculosis never became a human affliction, Dr. Woodruff avers, until long after man began to cluster together in confined shelters, in hordes, in towns, in dusty cities, where water and milk had to be hauled great distances and became contaminated on the way.

One species of spider rolls her eggs up in a ball and tugs them along after her wherever she goes. Some fish build real nests in the water, in which the eggs are deposited. In this case it is the male who builds the nest in the water, and a number of females lay their eggs. The Chinese Makropden also builds nests in the water, and it is the male that keeps watch over them.

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Long before the little ones are born the care of the eggs becomes a matter of great concern to nearly every species of the lower animals. The infinite pains that are taken in hatching and hiding them are surprising. It is not always the female who is most solicitous—sometimes it is the male who hatches the eggs and nurses the little ones until they are able to shift for themselves.

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## How the EARTH DRAWS ITS BREATH

WHILE conducting certain experiments in atmospheric electricity, Dr. R. Boernstein has made the interesting discovery that the earth breathes. A continual exchange of air between earth and atmosphere takes place, just as a human being discharges vitiated air with one breath and inhales new air with the next.

To ascertain more about the earth's respiration, Dr. Boernstein sank a pipe into the earth to the depth of one yard and connected this with a mercury barometer in the cellar of the house in which the experiment was conducted. He found that from 7 a. m. until 5 or 6 p. m. the pressure of air coming from the earth is greater than the pressure of the surrounding atmosphere seeking to enter the earth, while at night the reverse is the case.

This difference in pressure is probably due to the fact that in the daytime the atmosphere entering the earth is subjected to the pressure of light, which Bartoli, Maxwell and Boltzmann proved theoretically to be an actual factor among cosmic forces. Infinitesimal as is the pressure of light, there is no doubt that a substance so light as air would be noticeably affected by it.

Sven Arhenius, the famous astronomer, believes that the pressure of light is the motive power which propels the spores containing life germs from one planet to another. Dr. Arhenius figures out that, although barely visible to the naked eye, these spores are large enough to resist being attracted by the gravity of the sun and to be propelled into interplanetary space by the pressure of light, which, in the atmosphere of the sun, is prodigious as compared quantitatively with the pressure of light elsewhere.